

University of Groningen

Gaining insight in factors associated with successful ageing: body composition, nutrition, and cognition

Nijholt, Willemke

DOI:
[10.33612/diss.102704591](https://doi.org/10.33612/diss.102704591)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2019

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Nijholt, W. (2019). *Gaining insight in factors associated with successful ageing: body composition, nutrition, and cognition*. [Thesis fully internal (DIV), University of Groningen]. Rijksuniversiteit Groningen.
<https://doi.org/10.33612/diss.102704591>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

**Gaining insight in factors associated with
successful ageing:
body composition, nutrition, and cognition**

Willemke Nijholt

Nijholt, W.

Gaining insight in factors associated with successful ageing: body composition, nutrition, and cognition

PhD thesis, University of Groningen, the Netherlands.

The research described in this thesis was performed at the Research Group Healthy Ageing, Allied Health Care and Nursing of the Hanze University of Applied Sciences

Financial support for the printing of this thesis by the following sponsors is gratefully acknowledged:

- Research Group Healthy Ageing, Allied Health Care and Nursing, Hanze University of Applied Sciences
- Graduate School for Health Services Research (SHARE)
- University Medical Center Groningen
- University of Groningen
- Mediq Tefa BV, De Meern
- Stichting Beatrixoord Noord-Nederland
- Alzheimer Nederland
- Haryt Dijkman Advies, Molenend
- Nutricia Specialized Nutrition

Cover illustration: Nancy Halsema

Layout and Printing by Ridderprint | www.ridderprint.nl

ISBN: 978-94-034-2150-6

ISBN: 978-94-034-2149-0 (electronic version)

© 2019, Willemke Nijholt, Groningen, the Netherlands.

All rights reserved. No part of this thesis may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, by photocopying, recording or otherwise, without the prior permission of the author.



rijksuniversiteit
 groningen

Gaining insight in factors associated with successful ageing: body composition, nutrition, and cognition

Proefschrift

ter verkrijging van de graad van doctor aan de
Rijksuniversiteit Groningen
op gezag van de
rector magnificus prof. dr. C. Wijmenga
en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op

woensdag 18 december 2019 om 12.45 uur

door

Willemke Nijholt

geboren op 5 februari 1988
te Tietjerksteradeel

Promotor

Prof. dr. C.P. van der Schans

Copromotores

Dr. J.S.M. Hobbelen

Dr. H. Jager-Wittenaar

Beoordelingscommissie

Prof. dr. J.M. Klaase

Prof. dr. I. Bautmans


Prof. dr. ir. C.P.G.M. de Groot

Paranimfen

Lies ter Beek

Ellen de Wit

Table of content

1	General introduction -----	9	2	The reliability and validity of ultrasound to quantify muscles in older adults: a systematic review. -----	21
2	The use of ultrasound for the estimation of muscle mass: one site fits most? -----	45	3	Reliability and validity of ultrasound to estimate muscles: a comparison between different transducers and parameters. --	53
4	The added value of ultrasound muscle measurements in patients with COPD: An exploratory study. -----	67	5	Content validity across methods of malnutrition assessment in patients with cancer is limited. -----	83
6	Dietary protein intake, muscle mass, and physical function in older adults: a descriptive 1-year follow-up study. -----	109	7	Are a healthy diet and physical activity synergistically associated with cognitive functioning in older adults? -----	123
8	General discussion -----	139	 Appendices -----		155
				Samenvatting -----	156
				Dankwoord -----	159
				Over de auteur -----	160
				Research Institute SHARE -----	162

